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EXAMINER	
STEVENS, THOMAS H	

ART UNIT	PAPER NUMBER
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NOTIFICATION DATE	DELIVERY MODE
11/06/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/010,238	Applicant(s) BLATT ET AL.
	Examiner Thomas H. Stevens	Art Unit 2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 28 September 2007.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-3,5-8 and 10-16 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-3,5-8,10-16 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-3,5-8,10-16 were examined.

Section I: Prosecution Reopened

2. In response to applicants' request for a pre-appeal brief conference, a pre-appeal brief conference was held on 09/04/2007. Based upon the results of the conference, the finality of the previous office action is withdrawn and prosecution is re-opened.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3,5-8,10-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Seng et al., titled, "Power-Sensitive Multithreaded Architecture" (Sept. 2000; hereafter Seng). Seng teaches power optimization process through power simulators.

Claim 1. A method for analyzing a power modeling (pg. 2, "3. Modeling Power" section) simulation (pg. 2, "2. Related Work" section, 3rd paragraph, "SMTSIM simulator...to model a multithreaded processor") , comprising: receiving simulated power value data (examples of power data results, pg. 4 figure 1 and pg.4, left column,3rd paragraph, lines 2-3, "...power and performance appear to be positively correlated...) from a power modeling (pg. 2, "3. Modeling Power" section) simulator,

wherein the power value data (examples of power data results, pg. 4 figure 1 and pg.4, left column,3rd paragraph, lines 2-3, "...power and performance appear to be positively correlated...) comprises at least one type of power value selected from MAX, TYP, MIN, and TypMax (these values are inherent to an average power value ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power"); generating a set of summary data (pg.3, table 2; pg. 5, figures 3 and 4) from the power value data; and reporting the summary data (pg.3, table 2; pg. 5, figures 3 and 4), wherein the summary data (pg.3, table 2; pg. 5, figures 3 and 4) includes at least one type of data selected from single-cycle summary data (pg.3, table 2; pg. 5, figures 3 and 4) configured to report a peak single cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") power value, wherein a derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") power value is a difference between two particular associated power values in the simulation (pg. 2, "2. Related Work" section, 3rd paragraph, "SMTSIM simulator...to model a multithreaded processor") , multi-cycle summary data (pg.3, table 2; pg. 5, figures 3 and 4) configured to report a peak average power value over multiple cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4), and multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance

process...average power") data configured to report a peak derivative (these values are inherent since a derivative requires different values, the same values to calculate average power,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") power value over multiple cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4).

Claim 2. The method of claim 1, wherein: generating summary data (pg.3, table 2; pg. 5, figures 3 and 4) includes generating multi-cycle summary data (pg.3, table 2; pg. 5, figures 3 and 4), comprising: calculating a value of a single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power"), wherein the single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") is a derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") of two particular power data in a set of successive cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4).

Claim 3. The method of claim 2, wherein the single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate

average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) is a peak single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”).

Claim 5. A method of analyzing power modeling (pg. 2, “3. Modeling Power” section) simulation (pg. 2, “2. Related Work” section, 3rd paragraph, “SMTSIM simulator...to model a multithreaded processor”) for designing a chip, comprising: obtaining a plurality of power value data (examples of power data results, pg. 4 figure 1 and pg.4, left column,3rd paragraph, lines 2-3, “...power and performance appear to be positively correlated...)from a power modeling (pg. 2, “3. Modeling Power” section) simulator, wherein the plurality of power values comprises at least one type of power value selected from MAX, TYP, MIN, and TypMax (these values are inherent to an average power value ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”); generating a set of summary data (pg.3, table 2; pg. 5, figures 3 and 4); and reporting the summary data (pg.3, table 2; pg. 5, figures 3 and 4) as parameters for chip design, wherein the summary data (pg.3, table 2; pg. 5, figures 3 and 4) includes at least one type of data selected from single-cycle summary data (pg.3, table 2; pg. 5, figures 3 and 4) configured to report a peak single cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) power value, wherein a derivative (these values are inherent

since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") power value is a difference between two particular associated power values in the simulation (pg. 2, "2. Related Work" section, 3rd paragraph, "SMTSIM simulator...to model a multithreaded processor") , multi-cycle summary data (pg.3, table 2; pg. 5, figures 3 and 4) configured to report a peak average power value over multiple cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4), and multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") data configured to report a peak derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") power value over multiple cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4).

Claim 6. The method of claim 5, wherein generating summary data (pg.3, table 2; pg. 5, figures 3 and 4) comprises: calculating a multiple-cycle power average, wherein the multi-cycle power average is an average of the power value data (examples of power data results, pg. 4 figure 1 and pg.4, left column,3rd paragraph, lines 2-3, "...power and performance appear to be positively correlated...) over a plurality of cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4).

Claim 7. The method of claim 6, wherein a length of the plurality of cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4) is fixed.

Claim 8. The method of claim 6, wherein generating summary data (pg.3, table 2; pg. 5, figures 3 and 4) further comprises: calculating a peak value of the multi-cycle power average (pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power").

Claim 10. A method of data analysis for a power modeling (pg. 2, "3. Modeling Power" section) simulation (pg. 2, "2. Related Work" section, 3rd paragraph, "SMTSIM simulator...to model a multithreaded processor") , comprising: obtaining a plurality of power value data (examples of power data results, pg. 4 figure 1 and pg.4, left column,3rd paragraph, lines 2-3, "...power and performance appear to be positively correlated...)from a power modeling (pg. 2, "3. Modeling Power" section) simulator, wherein the power value data (examples of power data results, pg. 4 figure 1 and pg.4, left column,3rd paragraph, lines 2-3, "...power and performance appear to be positively correlated...)comprises at least one type of power value selected from MIN, TYP, MAX, and TypMax; generating a set of summary data (pg.3, table 2; pg. 5, figures 3 and 4) from the power value data; analyzing the summary data (pg.3, table 2; pg. 5, figures 3 and 4) according to a design requirement; and reporting a result of the analyzing step; wherein the summary data (pg.3, table 2; pg. 5, figures 3 and 4) includes at least one type of data selected from single-cycle summary data (pg.3, table 2; pg. 5, figures 3 and 4) configured to report a peak single cycle derivative (these

values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) power value, wherein a derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) power value is a difference between two particular associated power values in the simulation (pg. 2, “2. Related Work” section, 3rd paragraph, “SMTSIM simulator...to model a multithreaded processor”) , multi-cycle summary data (pg.3, table 2; pg. 5, figures 3 and 4) configured to report a peak average power value over multiple cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4), and multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) data configured to report a peak derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) power value over multiple cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4).

Claim 11. The method of claim 10, further comprising: calculating a value of the multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”).

Claim 12. The method of claim 11, further comprising: setting a threshold value as a reference value for determining the end of a current multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”); calculating a single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”); calculating a derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) of a start value and an end value of associated power data in the current multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”); calculating a ratio of the value of the single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) over the value of a derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) of the start value and the end values of associated power data derivative (these values are inherent since a derivative requires different values,

the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) when the direction of the current multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) changes; and generating the value and its cycle of the multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) when the ratio becomes larger than the threshold value, wherein the single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) is a derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”) of two particular power data in successive cycles (suggestion of different cycle types, pg. 3, right column, paragraph 4).

Claim 13. The method of claim 11, further comprising: setting a threshold value that is a reference value for determining the end of a current multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, “4. Methodology” section, lines 10-14 “... performance process...average power”); calculating a difference from a highest value to a current value of the power data in the current multi-cycle derivative (these values are inherent

since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power"); calculating a difference from the highest value to a start value of the power data in the current multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power"); calculating a ratio of the difference from the highest value to the current value of the power data over the difference from the highest value to the start value of the power data in the current multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") when the direction of the current multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") changes; and generating the end-value and its end-cycle of the current multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") when the ratio becomes larger than the threshold value.

Claim14. The method of claim 1, further comprising: applying an automatic detection scheme to detect an end for an multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3,

"4. Methodology" section, lines 10-14 "... performance process...average power") (MCD), if an multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") is included in the summary, wherein the automatic detection scheme is one selected from single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") (SCD)/MCD, DROP/TOP, and a combination thereof.

Claim 15. The method of claim 5, further comprising: applying an automatic detection scheme to detect an end for an multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power"), if an multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") is included in the summary, wherein the automatic detection scheme is one selected from single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") (SCD)/MCD, DROP/TOP, and a combination thereof.

Claim 16. The method of claim 10, further comprising: applying an automatic detection scheme to detect an end for an multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power"), if an multi-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") is included in the summary, wherein the automatic detection scheme is one selected from single-cycle derivative (these values are inherent since a derivative requires different values, the same values to calculate average power ,pg. 3, "4. Methodology" section, lines 10-14 "... performance process...average power") (SCD)/MCD, DROP/TOP, and a combination thereof.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure:

- Mudge, T., "Power: A First-Class Architectural Design Contraint" INSPEC pg.-52-58.
- Musoll et al., "Scheduling and Resource Binding for Low Power" 1995 8th International Symposium on System Synthesis" pg.104-109; illustrates how power consumption issues can be tackled during the scheduling and resource-binding steps of high-level synthesis.

- US Patent 5,55,201 teaches a technique for hierarchical display of control and dataflow graphs allowing a user to view hierarchically filtered control.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715.

If attempts to reach the examiner by telephone are unsuccessful, please contact examiner's supervisor Mr. David Vincent 571-272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.. Answers to questions regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) (toll-free (866-217-9197)).

David Vincent 11/1/07
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